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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/720,295

11/24/2003

Sergio Martins Loureiro

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4132

6147 7590 09/25/2007  
GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH  
PATENT DOCKET RM. BLDG. K1-4A59  
NISKAYUNA, NY 12309

EXAMINER
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PARKER, FREDERICK JOHN

ART UNIT	PAPER NUMBER
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1762

MAIL DATE	DELIVERY MODE
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09/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/720,295	<b>Applicant(s)</b> LOUREIRO ET AL.	
	<b>Examiner</b> Frederick J. Parker	<b>Art Unit</b> 1762	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
- 4a) Of the above claim(s) 1-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 47-62 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/20/07 has been entered.

2. The rejections of the previous Final Office Action are withdrawn in view of amendment and replaced by those which follow:

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 47-60,62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chao et al US 2003/0152759 in view of Pinnavaia et al US 5840264.

Chao teaches forming templated nanostructured materials comprising providing a mesoporous host material with uniform and ordered mesopores and subsequently incorporating *charged particle/precursors* (e.g. metal salts, oxo or other complexes, metal ligand hybrids, etc per claims 49,53) into the functionalized mesoporous material by impregnation (abstract; etc) or solution [0025] and treating the product for crystallization, oxidation or precipitation [0029], as to form metal oxides in nano scale particles, wires, or networks including mixed metal oxide nanostructures [0026-27]. Mesoporous hosts include silica, titania, etc in numerous forms [0020]. Oxidation of metal complexes using oxygen is cited [0027]. Particles are inherently less than 100 nm because the mesopores into which they are incorporated are 0.1-50 nm, and further, examples show particles less than 100 nm. Particle materials exemplified in [0024] comprise Zr and Ti, which are group IVB metals, which when oxidized would become IVB metal oxides in a mesoporous ceramic matrix, e.g. silica, zirconia, etc..

The mesoporous host may be prepared by mixing functional groups comprising amines, alcohols, etc with attaching groups e.g. organic silanes which are treated by ageing, washing, and drying to form templated mesoporous hosts {0019-0022}. The Examples teach forming templated silica hosts, which as in Ex. 10 [0040] an iron solution is added, followed by heating in oxygen at 500 C for 6 hours, per claims 50-51. The charged particles are added to the mesoporous material which carry an unlike attractive charge, resulting in an electrostatic bond. Forming and providing a neutral templated mesoporous material is not cited.

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Pinnavaia et al teaches on col. 6 that it is conventional in the art to use charged surfactant ions (+ or -) as template materials in framework mesoporous materials. It is recognized that such charging mechanisms are expensive, strongly bonded, and are difficult to recover, as well as some materials posing potential health risks. To solve the recognized problems, Pinnavaia et al teaches the use of neutral mesoporous structures utilizing hydrogen bonding using neutral surfactants and neutral inorganic oxide precursors (abstract, etc) which provides advantages of larger wall thicknesses, small particle sizes, and improved meso-porosities. Thus a neutral inorganic oxide precursor and neutral template material are mixed and aged to form a crystalline product, and optionally heat treating (col. 8, 38-64. Use of a commercially available silica as a starting neutral material is also recognized (col. 12, 26-31). The product results in small elementary particle sizes of <400Å . Products may be subsequently impregnated to emplace active elements such as catalytically active metals.

Chao teaches adding charged particles to functionalized mesoporous materials, whereas Pinnavaia et al recognizes the negative (sic) attributes of electrostatics in mesoporous composites. Pinnavaia et al solves the problems by use of neutral mesoporous materials which results in advantageous hydrogen bonding and improves material properties. In view of the overall teachings, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Chao for making templated mesoporous materials using charged particles by substituting neutral materials by which to form a neutral mesoporous network as taught by Pinnavaia et al to avoid the recognized problems associated with charged materials and to achieve the added recognized benefits accrued by using neutral mesoporous materials, as described above.

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6. Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chao in view of Pinnavaia et al US 5840264 and further in view of Pham US 6548440.

Chao and Pinnavaia et al are cited for the same reasons previously discussed, which are incorporated herein. Forming methods are not cited. However, Pham teaches an analogous method of forming templated mesoporous materials comprising metal oxide particles <100 nm, in which spray drying is taught on col. 11,44 to col. 12, 63 and elsewhere as a means to form the metal oxide templated silica meso-structure. Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the method of Chao et al in view of Pinnavaia et al by utilizing spray drying as taught by the similar process of Pham because of the expectation of forming a metal oxide templated silica meso-structure.

### ***Response to Arguments***


Applicants arguments have been considered. Their gist is that the previously cited prior art does not teach a neutral mesoporous matrix material, Chao specifically citing functionalized surfaces and the use of charged particles. The Examiner agrees and has withdrawn the previous rejection. The new rejection above deals with the issues brought up by Applicants' amendments regarding a neutral mesoporous matrix. Hence, further response to Applicants arguments is moot.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick J. Parker whose telephone number is 571/ 272-1426. The examiner can normally be reached on Mon-Thur. 6:15am -3:45pm, and alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571/272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Frederick J. Parker  
Primary Examiner  
Art Unit 1762

fjp